

L 26391-66 EWA(h)/EWT(m)

ACC NR: AM5025517

Monograph

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YEgorov, I. M.; Zhernov, V. S.; Lazarev, A. F.; Perov, N. L.; Timofeyev, A. A., comps.

Apparatus for recording and investigating ionizing radiation; a handbook (Apparatura dlya registratsii i issledovaniya ioniziruyushchikh izlucheni; spravochnik) Moscow, Atomizdat, 1965. 429 p. illus., biblio. 4500 copies printed.

TOPIC TAGS: radiation dosimetry, ionizing radiation, nuclear physics apparatus, scintillator photomultiplier, gas discharge counter, ionization chamber, radiation dosimeter, radiometer, spectrometer

PURPOSE AND COVERAGE: This handbook is intended for research physicists in the field of dosimetrics and engineers and scientists dealing with radioactive sources of radiation. It may also be useful to persons concerned with the development, operation, and maintenance of dosimetric, spectrometric, and radiometric equipment. The book deals with Soviet experimental nuclear physics instruments, equipment, photomultipliers, scintillatofs, Geiger-Mueller counters, ionization chambers, etc. Characteristics of instruments for individual dosimetric control, measurements of doses and dose power, determination of the contamination of working areas and water by radioactive substances, aerosol devices, single and multichannel pulse analyzers, and others are described.

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SUB CODE: 09, 20/ SUBM DATE: 29Apr65/ ORIG REF: 068/ OTH REF: 002

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IZOTOV, V.K.; LAZAREV, A.F.

Stimulating effect of the somatotropic hormone on immunization  
with tick-borne encephalitis virus. Vop. virus. 10 no.3:280-  
282 My-Je '65. (MIRA 18:7)

1. Institut poliomiyelita i virusnykh er<sup>+</sup>sefalitov AMN SSSR i  
Vsesoyuznyy institut eksperimental'noy endokrinologii, Moskva.

FRIDMAN, N.S.; LAZAREV, A.F.; LIMANOVA, Ye.Ye.; GRODZENSKIY, P.G.

Distribution of thyrotropin-<sup>131</sup>I in the extraction of protein hormones of the hypophysis. Probl. endok. i gorm. 11 no. 4: 73-77 J1-Ag '68. (MIRA 18-11)

1. Vsesoyuznyy institut eksperimental'noy endokrinologii (dir. prof. Ye.A. Vasyukova, Moskva.

LAZAREV, A.F.; ELOTOV, V.K.

Effect of antiserum to the growth hormone on Crocker's  
sarcoma. *Biul. eksp. biol. i med.* 60 no.9:99-101 S '65.  
(MIRA 18:10)  
1. Institut poliomielita i virusnykh entsefalitov AMN SSSR,  
Moskva.

LAZAREV, A.I., inzh.

Using propane-butane in welding pipelines. Mont. i spets. rab. v.  
stroi. 22 no.12:16 D '60. (MIRA 13:11)

1. Trest Bashsantekhmontazh.  
(Pipelines--Welding) (Gas welding and cutting)

IAZAREV, A.I., inzh.

Welding tip operating on propane-butane. Svar. proizv. no.12:33  
D '61. (MIRA 14:12)

1. Trest "Bashsantekhmontazh".  
(Gas welding and cutting—Equipment and supplies)



1629. Chromatographic separation of molybdenum and rhenium. D. I. Ryvachukov and A. I. Lashin (Dokl. Akad. Nauk S.S.S.R., 1977, 237, 777-779).—As in acid solution  $\text{Re}^{VII}$  forms the singly charged ion  $\text{ReO}_4^-$ , while  $\text{Mo}^{VI}$  forms the doubly charged  $\text{MoO}_4^{2-}$ , the latter can be retained on cationites while  $\text{ReO}_4^-$  passes through unadsorbed. The active groups of cationites in order of decreasing adsorbing power for Mo are:  $\text{SO}_3\text{OH} < \text{CH}_3\text{SO}_3\text{OH} < \text{COOH} < \text{SO}_3\text{OH}$  and  $\text{OH}$ . Various anionites adsorb  $\text{MoO}_4^{2-}$  and  $\text{ReO}_4^-$  poorly in alkaline soln., whilst in acid soln., Re is preferentially adsorbed, because of the greater stability of  $\text{ReO}_4^-$ .  $\text{MoO}_4^{2-}$  can be completely adsorbed by activated  $\text{Al}_2\text{O}_3$  at pH values between 1 and 6.

R. C. MURRAY

LAZAREV, A. I.

Dissertation: "A New Analytical Reaction of Rhenium and Its Isolation by the Chromatographic Method." Cand Chem Sci, Novochoerkassk Polytechnic Inst, Novochoerkassk, 1953. (Referativnyy Zhurnal--Khimiya, Moscow, No 5, Mar 54)

SO: SUM 243, 19 Oct 54

LAZAREV, A.I.

All efforts into the struggle for further development of Soviet  
chemical science and industry. Soob.o nauch.rab.chl.VKHO no.1:1-3  
'53. (MIRA 10:10)

(Russia--Chemistry)

LAZAREV, A. I.

(2)

Chromatographic separation of molybdenum and rhenium  
D. T. Ryabchikov and A. I. Lazarev (*Dokl. Akad. Nauk. SSSR*, 1953, 88, 777-779).—Since in acid solution  $\text{Re}^{\text{VII}}$  forms the singly charged ion  $\text{ReO}_2^+$ , while  $\text{Mo}^{\text{VI}}$  forms the doubly charged  $\text{MoO}_4^{2-}$  ion, the latter is adsorbed on cationites while  $\text{ReO}_2^+$  passes through unadsorbed. The active groups of cationites can be arranged in order of decreasing adsorbing power for Mo, as:  $\text{SO}_3\text{H} < \text{CH}_3\text{SO}_3\text{H} < \text{COOH} < (\text{SO}_3\text{H} + \text{OH}) < (\text{COOH} + \text{OH})$ . Various anionites adsorb  $\text{MoO}_4^{2-}$  and  $\text{ReO}_4^-$  very poorly in alkaline solution, while in acid solution, Re is preferentially adsorbed, because of the greater stability of  $\text{ReO}_4^-$ . Activated  $\text{Al}_2\text{O}_3$  completely adsorbs  $\text{MoO}_4^{2-}$  at pH 1–6, but not  $\text{ReO}_4^-$ .  
R. C. MURRAY.

16-14-54  
*[Signature]*

LAZAREV, A. I.

1166. The determination of aluminum in alloys using cationites. A. I. Lazarev. Symposium: "Sovremennye Problemy Analiticheskoy Metallurgii" (1958) 142-144. Met. Anal. 1958, Abstr. No. 29,320. Ground the sample (in N form) in water for 4 hr., transfer to a volumetric flask and treat with N HCl (200 ml) and water (100 ml). Dissolve the alloy (0.4 g) in HCl and H<sub>2</sub>O (10 ml each) and evaporate to dryness. Add 10 ml of water to the residue. Add 10 ml of 10% NaOH soln. and stir. Pass it through the cationite at a rate of 1-2 ml/min. and wash with 20 to 40 ml of water. Reject the eluate. Remove Al from the column by treatment with 5% NaOH (200 ml) and water (120 ml). Neutralize the eluate with conc. HCl, add 3 ml in excess and 10 ml of 1% H<sub>2</sub>SO<sub>4</sub> soln. of alum. and To remove Ca, add 6 g of Na<sub>2</sub>CO<sub>3</sub> to the soln. and boil for 2 to 3 min. and filter. Wash the ppt. with hot dil. HCl (1:1) and reject the residue. Heat the filtrate to boiling-point, add a 10% soln. of (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub> (200 ml) and a 20% soln. of Na acetate (20 ml), and boil for 5 to 10 min. Filter off the ppt., wash it with hot 1% NH<sub>4</sub>NO<sub>3</sub> soln., dissolve it in dil. HCl (1:1) (10 ml) and reprecipitate the Al. Ignite the ppt. at 1000° and weigh.

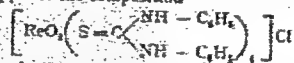
C. D. Kozlov

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LALAN, A. I.

1357. Analytical chemistry of rhenium. U. I. Ryabchikov and A. I. Lavretskii. *Tr. Gosnauk. Inst. Geokh. i. Khim. 1955, 10 (4), 234-235.*

In the colorimetric determination of Re with thiourea, the solution is mixed with 5 ml of conc. HCl, 5 ml of 5 per cent. aq. thiourea solution and 1 ml of 20 per cent. SnCl<sub>2</sub> in HCl and diluted to 25 ml with water in a calibrated flask. After 5 to 10 min. at 65° to 70° C. the solution is cooled and the colour intensity is measured, with a deep-blue filter: 10 to 15 µg of Re can be determined in 25 ml. Oxidizing agents, Hg<sup>2+</sup>, Cu<sup>2+</sup>, Fe<sup>3+</sup>, W<sup>6+</sup>, Te<sup>6+</sup>, Se<sup>6+</sup>, As<sup>5+</sup> and ions that form stable complexes with thiourea, interfere. Fluorides, citrates, tartrates and oxalates do not interfere, and the interference of Sb can be masked by F<sup>-</sup>. Another determination is based on the reaction of Re with diphenylthiourea, when a ppt. of the composition



is obtained. The ppt. is dissolved in NaOH and H<sub>2</sub>O<sub>2</sub> and the thiocyanate colorimetric method is applied.

G. S. SMITH

5000

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MA 224

LAZAREV; A

1190. The chromatographic separation of  
gases. XII. The separation and analysis of  
gaseous hydrocarbons. J. Janak, M. Reisk and A.  
Lazarev (Inst. Petrol. Res., USSR, Czechoslovakia).  
Coll. Czech. Chem. Commun. 58: 29 (5), 1189-1196.  
The separation of mixtures of homologous cyclo-  
paraffins (e.g., cyclopropane and methylcycloprop-  
ane, and cyclopropane and cyclobutane) on silica gel  
and charcoal at 20°C and 40°C is described. The  
adsorption on silica gel increases with the increasing  
energy content, i.e., strain, for hydrocarbon mole-  
cules having the same number of carbon atoms and  
does not depend on the boiling point. The order of  
elution of mixtures of gases containing either 2 or  
3 carbon atoms is, e.g., ethane, ethylene, acetylene  
and propane, cyclopropane, propylene, propyne.  
The quantitative analysis of a mixture of air,  
CO, ethane, ethylene, propylene and cyclobutane  
with an error of 0.4 per cent. and of synthetic  
mixtures of air, He, O<sub>2</sub>, N<sub>2</sub>, ethylene and cyclo-  
propane with an error of 1 per cent. is possible.  
P. 5. 1196

(2)

1000

The complex of rhenium with dimethylglyoxime. A. I.  
Lazarev. *J. Gen. Chem. U.S.S.R.* 25, 2159-63 (1950) (Engl.  
translation).—See *C.A.* 50, 6244g.  
B. M. R.



LAZAREV, A.I.

460

✓ 1722

RHENIUM COMPLEX WITH DIMETHYLGLYOXIME. A. I.  
Lazarev, (Kulbyshov Indust. Inst.) Zhur. Obshchei Khim.  
19, 2120-2121 (1955) Nov. (in Russian)

ch The physico-chemical and toxic chromatographic methods  
were applied in the study of rhenium complex with dimethyl-  
glyoxime. The complex formula of the  $(\text{ReCl}_4\text{DmjCl}_2)_2$   
formed in the hydrochloric acid medium in the presence  
of tin chloride was suggested. (B.V.J.)

18-22

LAZAREV, A.

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CZECH

Chromatographic microanalysis of gases. III. Separation and analysis of gaseous cycloparaffins. Jaroslav Janák, Miroslav Růžek, and Antonín Lazarev (Ústav pro palivový výzkum, Brno, Czech.). Chem. Listy 49, 700-5 (1958); cf. C.A. 49, 8047g. Chromatographic analysis was extended to gaseous cycloparaffins. Chromatographic spectra were measured for cyclopropane (I), methylcyclopropane (II), and cyclobutane (III).  $R_f$  values on activated C at 80° were 0.0857 for I, 0.0380 for II; on silica gel at 20° 0.0138 for I, 0.0041 for II; and on silica gel at 80° 0.257 for I, 0.163 for II, and 0.163 for III. Possibility of detg. the gaseous cycloparaffins in mixts. with other hydrocarbons is discussed. The method was used for the analysis of gaseous anesthetics and of the products of the photolysis of cyclopentanones wherein  $C_3H_6$  and  $MeCH:CH_2$  were found in addn. to the previously identified  $CO$ ,  $C_2H_4$ , and  $H_2$ . M. Hudlíček.

2

AA-65

LAZAREV, A.I.

USSR/Inorganic Chemistry - Complex Compounds

C.

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4122

Author : Lazarev, A.I.

Title : Action of Liquid Amalgams on Perrhenates

Orig Pub : Zh. neorgan. khimii, 1956, 1, No 3, 385-391

Abstract : Zn amalgam reduces  $\text{KReO}_4$  (I) in sulfuric as well as in hydrochloric acid solutions. In both media the degree of reduction of Re decreases with increasing concentration of the acid, which the author attributes to the formation of complexes of the reduction products and the  $\text{Cl}^-$  or  $\text{SO}_4^{2-}$  anions. At  $\text{H}_2\text{SO}_4$  concentration  $< 3.6$  g-equivalent/liter  $\text{Re}(7+)$  is reduced to Re of a degree of oxidation  $< 1+$ . In 7N  $\text{H}_2\text{SO}_4$  reduction proceeds to mixtures of  $\text{Re}(1+)$  and  $\text{Re}(2+)$ . In 10-18N  $\text{H}_2\text{SO}_4$  reduction proceeds to about  $\text{Re}(4+)$ . Depending on the concentration of  $\text{H}_2\text{SO}_4$  or HCl the Cd amalgam reduces I to mixtures of  $\text{Re}(3+)$ ,  $\text{Re}(4+)$  and  $\text{Re}(5+)$ . On shaking Cd amalgam

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USSR/Inorganic Chemistry - Complex Compounds

C.

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4122

with solutions of  $\text{I}$  in 9N  $\text{H}_2\text{SO}_4$  for  $\geq 8$  minutes,  $\text{Re}(7+)$  is converted to  $\text{Re}(4+)$ . On action of Pb amalgam on hydrochloric acid solutions of  $\text{I}$   $\text{Re}(7+)$  is reduced to about  $\text{Re}(4+)$ . Bi amalgam reduces  $\text{Re}(7+)$  if the concentration of  $\text{H}_2\text{SO}_4$  is not less than 7 g-equivalent/liter. At concentration of  $\text{H}_2\text{SO}_4 > 10\text{N}$  hot and cold solutions of  $\text{I}$  are reduced to  $\text{Re}(5+)$ . For determination of Re the solution under study, 18N in  $\text{H}_2\text{SO}_4$ , is shaken for 10 minutes with 2-3% Bi amalgam in a current of  $\text{CO}_2$ . The  $\text{Re}(5+)$  thus formed is titrated with 0.03N  $\text{K}_2\text{Cr}_2\text{O}_7$  to phenyl-anthranilic acid. 0.44-10.77 mg

Re are determined by this method with a relative error which as a rule is  $\leq 2\%$ . At concentrations of HCl 2N the Bi amalgam reduces  $\text{I}$  to a state close to  $\text{Re}(4+)$ .

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RYABCHIKOV, D.I.; LAZAREV, A.I.

Chromatographic separation of molybdenum and rhenium. Trudy Kom. anal.  
khim. 7:41-63 '56. (MLRA 9:9)

1. Institut geokhimii i analiticheskoy khimii imeni V.I. Vernadskogo AN  
SSSR.  
(Molybdenum) (Rhenium) (Chromatographic analysis)

*LAZARYEV, A. I.*

USSR/Analytical Chemistry - Analysis of Inorganic Substances, G-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 1236

Author: Ryabchikov, D. I., and Lazaryev, A. I.

Institution: Academy of Sciences USSR

Title: Separation of Rhenium from Vanadium and Tungsten by Ion-Exchange Chromatography

Original

Periodical: Tr. komis. po analit. khimii AN SSSR, 1956, Vol 7, No 10, 64-67

Abstract: For the separation of Re from V, 100 ml of 0.3 N HCl containing less than 0.75 mg of V and varying amounts of Re are passed through a column packed with 10 gms of MMG-1 anion-exchange resin (OH form) with a flow rate under 3 ml/min. Upon washing with 0.3 N HCl the V is transferred to the filtrate and the Re retained on the column is eluted with 250 ml 2.5 N NaOH. The separation of Re from V can also be carried with SBS cation-exchange resin (hydrogen form). A solution giving an acid reaction with congo paper (100 ml) is passed through a column packed with 15 gms of cation-exchange resin (12 mm

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USSR/Analytical Chemistry - Analysis of Inorganic Substances, G-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 1236

Abstract: diameter) at a rate of 2-3 ml/min. The column is washed with 150 ml acidified water. The Re is eluted as  $\text{ReO}_4^-$ ; the V is eluted by washing with 100 ml of 1:4  $\text{NH}_3$  solution.

For the separation of V from W, 2.5 ml 3%  $\text{H}_2\text{O}_2$  are added to 50 ml of a solution containing  $\text{W}^{+6}$  and  $\text{V}^{+5}$ ; the pH of the solution is adjusted to 1.0 with HCl. The colored solution is passed through a column packed with anion-exchange  $\text{Al}_2\text{O}_3$  from which the V is eluted by successive washings with 25 ml of a solution of pH 1.0 containing one milliliter of 3%  $\text{H}_2\text{O}_2$  and 75 ml of pH 1.0 solution free of  $\text{H}_2\text{O}_2$ . The filtrate containing the V complex is boiled and cooled, after which it is acidified with  $\text{H}_2\text{SO}_4$  and the V is titrated with the ferrous salt of phenylanthranilic acid. The W is eluted from the column with 200 ml of 1:3  $\text{NH}_3$  solution and 50 ml of water and determined in the filtrate by the usual methods. For the separation of Re from W, 0.05-0.15 gms of alloy are fused with 3 gms  $\text{Na}_2\text{CO}_3$  and 0.5 gms  $\text{NaClO}_3$  in a Pt crucible, followed by leaching with hot water. The solution containing  $\text{Na}_2\text{WO}_4$ ,  $\text{NaReO}_4$ ,  $\text{Na}_2\text{CO}_3$ , and NaCl is neutralized and acidified with HCl until an acid test is obtained with congo paper, after which the solution is

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USSR/Analytical Chemistry - Analysis of Inorganic Substances, G-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 1236

Abstract: passed through a column of anion-exchange  $\text{Al}_2\text{O}_3$ . The column is irrigated with 20 ml of 0.1 N HCl. The Re is eluted with 75 ml of 0.1 HCl. The filtrate and wash solutions containing the Re sample are diluted to 200 ml; 25-30 ml of the solution are treated with 10 ml HCl (sp. gr. 1.19); when the solution has cooled, one milliliter of 20% KSCN or  $\text{NH}_4\text{SCN}$  and 1.5 ml of 25% solution of  $\text{SnCl}_2$  in 1:1 HCl are added, and the solution diluted to 50 ml; after 10 minutes, the thiocyanate complex of Re is determined spectrophotometrically or visually. The W is eluted with 200 ml of 1:3  $\text{NH}_3$  solution and 50 ml water. The filtrate is combined with 50 ml of concentrated HCl and 10 ml of 0.5% gelatin solution, and heated over a water bath for 40-60 minutes. After filtration and 5 washings with hot HCl, the filter with the precipitate is ignited and heated to 700-800°; after cooling, the weight of  $\text{WO}_3$  is determined. For the preparation of the anion-exchange  $\text{Al}_2\text{O}_3$  column a 250 ml beaker is filled with 75-100 gms of powdered  $\text{Al}_2\text{O}_3$ ; the powder is covered with water and shaken. After 2 minutes the fine suspension is decanted. The procedure is repeated 5 times, after which the  $\text{Al}_2\text{O}_3$  is dried and heated to 900-1,000° for 30-40 minutes. The  $\text{Al}_2\text{O}_3$  thus prepared is good for 50 operating cycles.

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LAZAREV, A. I.

Category: USSR

C

Abs Jour: RZh--Kh, No 3, 1957, 7784

Author : Lazarev, A. I.

Inst : Not given

Title : Reactions of Rhenium with Iron Cyanides

Orig Pub: Zh. Obshch. Khimii, 1956, Vol 26, No 4, 965-968

Abstract: The reactions between  $KReO_4$  (I) and  $K_4[Fe(CN)_6]$  (II) or  $K_3[Fe(CN)_6]$  and  $SnCl_2$  (III) in hydrochloric acid solution have been investigated and the optical density of the solutions was measured in the region 400-500  $m\mu$ . The molar extinction coefficient was calculated and was found to have a value of  $3 \times 10^3$ . Amyl and butyl alcohol extract a colored complex from the solution. SBS and Sulfougol-K cation-exchange resins in the acid form do not adsorb the complex; TM anion-exchange resins do. The optical density of the solutions along different cross sections of the ternary diagram I-II-III has been investigated. A maximum in the optical density was found at a I/II ratio of 1/1 (in the presence of an

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Category: USSR

C

Abs Jour: RZh--Kh, No 3, 1957, 7784

excess of III) and at a I/III ratio of 1/1. On the basis of these data, Re is assigned a pentavalent state in the investigated complex. The author gives the formula  $H_3 [ReO_2(CN)_6Fe]$  for the complex.

Card : 2/2

-16-

**AUTHORS:** Lazarev, A. I., Lazareva, V. I.

32-2-7/60

**TITLE:** The Colorimetric Determination of Titanium in Alloyed Steels by Means of the Addition Method  
(Kolorimetricheskoye opredeleniye titana v legirovannykh stalyakh metodom dobavok)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 2, pp. 145-146  
(USSR)

ABSTRACT: The above mentioned method is widely used for polarographic determinations. In the present work it is used for colorimetric determinations of titanium. In principle the course of the analysis is the following: The steel sample to be investigated is dissolved in the usual way and the solution is divided into three equal parts. To each of them the same amount of orthophosphoric acid is added in order to transform the  $\text{Fe}^{3+}$  ions to colourless complexes. A 3% hydrogenperoxide solution is added to the first and second part, and to the second part also a known quantity of titaniumsulfate solution is added. After filling up to a

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The Colorimetric Determination of Titanium in Alloyed Steels  
by Means of the Addition Method

32-2-7/60

certain volume with distilled water the solutions are colorimetrically measured. A colorfilter with a transparency of 400 m $\mu$  is recommended by D. P. Shcherbov (ref. 1). The third part of the solution to be investigated serves as "zero-solution". A table of the results for a steel sample with 25% of Ni and 5% of Cu, as well as a formula for calculation are given. According to the method described it is also possible to determine other elements, on the condition, that the components as well as the reagent are colorless or that a change of color is caused which corresponds to the Lambert-Beer theorem. There are 1 table, and 1 reference, 1 of which is Slavic.

ASSOCIATION: Industrial Institute of the Kuybyshev Hydro-Electric Plant  
(Industrial'nyy institut pri Kuybyshevskoy GES)

AVAILABLE: Library of Congress

Card 2/2

1. Titanium-Determination
2. Titanium-Polarographic analysis
3. Colorimetry-Applications

SOV/32-24-7-5/65

AUTHORS: Lazarev, A. I., Lazareva, V. I.

TITLE: The Application of Ascorbic Acid in the Determination of Molybdenum by the Thiocyanate Method (Primeneniye askorbinovoy kisloty pri opredelenii molibdena rodanidnym metodom)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 7, pp. 798 - 800 (USSR)

ABSTRACT: The influence of a number of factors on the formation of the molybdenum thiocyanate complex in the colorimetric determination of molybdenum was investigated. The optimum concentrations of hydrochloric acid, of thiocyanate and of ascorbic acid were found to be 1,4, 0,6, and 0,05 m/liter, respectively. The coloring reaches its maximum after 10 seconds. A light filter which is transparent for waves of 440 mμ wavelength is used. The presence of NO<sub>3</sub><sup>-</sup> ions in concentrations reaching 0,15 m/l displays no disturbing effect. When iron (III) is reduced in the presence of thiocyanates, citric or oxalic acid, the concentration of ascorbic acid must be raised to 0,1 m/l. A tungsten (IV) complex, vanadium, chromium, nickel and cobalt do not disturb the determination of molybdenum, as tungsten is

Card 1/2

LAZAREV, A.I.; LAZAREVA, V.I.

Analysis of a nickel electrolyte by means of static ion-exchange chromatography. Zav.lab. no.11:1301 '59. (MIRA 13:4)

1. Akmolinskiy sel'skokhozyaystvennyy institut.  
(Nickel-- Analysis)

S/137/60/000/008/005/009  
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 8, p. 247,  
# 18408

AUTHOR: Lazarev, A. I.

TITLE: Kinetics of Eutectoid Transformation of Steel at Various Heating Rates

PERIODICAL: Nauchn. tr. Leningr. in-t tekhn. i optiki, 1959, No. 37,  
pp. 99-107

TEXT: The author determined analytically the temperature  $t_n$  of eutectoid transformation of steel as a function of the heating rate  $v_{\text{heat}}$ , based on the temperature dependence of the specific decalescence power  $\omega(t)$ . For  $\omega(t)$  the following equation was found:  $\omega(t) = B [1 - \exp k_1(t - t_0)]$ , where  $B$  and  $k_1$  are constants,  $t_0$  is the superheat exceeding the equilibrium temperature of transformation. It is shown that  $t_n$  is determined by the formula:  $t_n = t_0 + 1/k_1 \ln(a v + 1)$ , where  $a$  is the constant, determined like  $k_1$ , from the experimental relation  $t_n(v)$ ,  $v_0$  is the heating rate below the transformation temperature.

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S/137/60/000/008/005/009  
A006/A001

# Kinetics of Eutectoid Transformation of Steel at Various Heating Rates

For annealed eutectic steel,  $k_1$  and  $a$  are equal to 0.094 degree<sup>-1</sup> and 8.3 sec/degree, respectively. To determine the heating curve in the transformation range and the time  $\tau_0$  in this range, required for the completion of the transformation, the following dimensionless values are used:  $\theta = \vartheta/\vartheta_n$  where  $\vartheta = t - t_0$ ,  $\vartheta_n = t_n - t_0$  and  $L = \tau(\nu_0 + 1/a)\vartheta_n^{-1}$ . Values are derived of the dimensionless quantities  $q = a = \nu_0(a\nu_0 + 1)^{-1}L$  and  $q = Q/(c\vartheta_n)$ , where  $Q$  is the heat spent for the transformation. Based on the known value  $Q_0$  of transformation heat, these quantities allow the graphoanalytical determination of the values  $L_0$  and  $\theta_0$ , corresponding to completed transformation; consequently  $\tau_0$  can be calculated.

L. P.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2



5(2)

AUTHOR:

Lazarev, A. I.

SOV/75-14-3-21/29

TITLE:

Detection and Determination of Rhenium (Otkrytiye i opredeleniye reniya)

PERIODICAL:

Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 3, pp 362-364 (USSR)

ABSTRACT:

Potassium perrhenate yields in the presence of hydrochloric acid, bivalent lead ion, and sulfite a colored complex compound which can be extracted by means of isoamyl alcohol and determined colorimetrically. Nickel, chromium, and cobalt, as well as molybdates and tungstates disturb. By means of the ion exchange chromatography the anion of the rhenium complex was found to cause the coloration. The valence of the rhenium in the complex was photometrically determined by reduction of tin chloride and found to be tetravalent. The figures show the light absorption curves of the rhenium complex under different conditions. Table 1 presents the influence exercised by the acid concentration upon the coloration, table 2 the analysis results. There are 3 figures, 2 tables, and 3 Soviet references.

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Detection and Determination of Rhenium

SOV/75-14-3-21/29

ASSOCIATION: Akmolinskiy sel'skokhozyaystvennyy institut  
(Akmolinsk Agricultural Institute)

SUBMITTED: September 27, 1957

Card 2/2

5(2)

AUTHORS:

Lazarev, A. I., Lazareva, V. I.

SOV/32-25-4-7/71

TITLE:

Colorimetric Method for the Determination of Antimony in Metallic Molybdenum and Molybdates (Kolorimetricheskiy metod opredeleniya sur'my v metallicheskom molibdene i molibdatakh)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 4, pp 405-406 (USSR)

ABSTRACT:

The reaction of methyl violet with antimony (V) is particularly sensitive and selective (Refs 1,2), and even greater quantities of other elements do not disturb this determination of antimony (Refs 3,4). Tests showed that from a 0.5 g of ammonium molybdate the antimony can be directly determined (without previous separation) unless too great quantities of molybdenum are present. In the present case a complex formation was used to eliminate this disturbing effect of Mo. Oxalic acid, citric, tartaric and orthophosphoric acid, as well as sodium pyrophosphate, were examined as complex formers. The best results were obtained with citric acid. The described analytic methods were examined on samples of pure molybdenum, molybdenum wire and ammonium molybdate (Table). The indicated course of analysis shows that the colorimetry was made on the FEK-M device with a green light

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Colorimetric Method for the Determination of Antimony in Metallic Molybdenum and Molybdates

SOV/32-25-4-7/71

filter. A higher accuracy of the analysis is attained with the use of an additional light filter Nr 9 which was suggested by D. P. Shcherbov (Ref 5). The method renders possible a determination of  $5 \cdot 10^{-6}\%$  Sb in molybdenum. There are 1 table and 5 Soviet references.

ASSOCIATION: Kuybyshevskiy industrial'nyy institut (Kuybyshev Industrial Institute)

Card 2/2

5(2)

AUTHORS:

Lazarev, A. I., Lazareva, V. I.

SOV/32-25-5-4/56

TITLE:

Determination of Zinc, Lead, and Cadmium in Brass and Bronze According to the Complexometric Method (Opredeleniye tsinka, svintsa i kadmiya v latunyah i bronzakh kompleksometricheskim metodom)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 5, pp 542-544 (USSR)

ABSTRACT:

In the case under review strong alkaline anion exchangers of the domestic trademark An2f were used for the determination of zinc, lead and cadmium according to the complexometric method. A complete absorption of Zn-, Pb- and Cd-complexes takes place from hydrochloric solutions of a concentration of 1.5 and 0.25 n. Fe, Cu and Al are scarcely absorbed under such conditions; the absorption of Cu and Fe increases, however, with a rise in the hydrochloric acid concentration. Owing to this, impurities were separated for zinc at 2 n acidity, and for cadmium and lead at 1 n acidity. A glass tube with an internal diameter of 16 mm and a length of 250 mm was used as an ion exchanger column, which was filled with 10 g of ion exchanger (grain

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Determination of Zinc, Lead, and Cadmium in Brass  
and Bronze According to the Complexometric Method

SOV/32-25-5-4/56

size 0.5 - 1.0 mm). Prior to the first working process, 200 ml 2 n NaOH solution, followed by 50 ml of distilled water and 100 ml of HCl of a concentration corresponding to the metal were flown through the column. The course of one such analysis is described, and the analytical results of some alloys are given (Table). There are 1 table and 5 references, 4 of which are Soviet.

ASSOCIATION: Kuybyshevskiy industrial'nyy institut (Kuybyshev Industrial Institute)

Card 2/2

5(2)

AUTHORS:

Lazarev, A. I., Lazareva, V. I.

SOV/32-25-7-3/50

TITLE:

Colorimetric Method for Determination of Cadmium With Rhodamine B (Kolorimetricheskii metod opredeleniya kadmiya s rodaminom B)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 7, pp 783-786 (USSR)

ABSTRACT:

A colorimetric method for determination of cadmium was elaborated which is based on the reaction of cadmium iodides with rhodamine B (I) (Ref 1). The reaction conditions were photometrically investigated on the FEK-M device. With an increase of the sulfuric acid concentration the sensitivity of the reaction (Table 1) is reduced, a fact, which can be observed to a much greater degree in the case of hydrochloric acid. As an optimum concentration of KI 0.1 n was found. The sequence of mixing of the test solutions is important. The degree of the optical density of the solution depends linearly on the cadmium concentration in the range 0 - 0.6  $\mu$ /ml. The sensitivity of the reaction amounts 0.08  $\mu$ /ml, corresponding to that on the spectrophotometer SF-4 (Ref 3). The determination accuracy in pure cadmium solutions is given (Table 2). In the presence of

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Colorimetric Method for Determination of Cadmium  
With Rhodamine B

SOV/32-25-7-3/50

citric acid, tartaric acid, oxalic acid, thiocarbamide, hydroxylamine and thiosulfate the reaction does not take place at all or else the sensitivity is strongly reduced; this fact also holds for organic solvents. The ratio  $Cd : J$  Rhodamine B in the case of the compound formed in the reaction above described is found to correspond to the formula  $[CdJ_4] (C_{29}H_{37}C_3N_2O_2)_2$ . The ions  $Cu^{2+}$ ,  $Bi$ ,  $Sb$  and  $Hg^{2+}$  react with iodides and thus disturb the determination described, a fact which was eliminated by the application of N-w-diethylthiocarbamate (Refs 4, 5). No cadmium determination according to the method described can take place in the presence of zinc (exceeding 10 mg). Iron (III) is converted with ascorbic acid into iron (II) and thus does not disturb analysis. The course of analysis for the determination of cadmium according to the method described in magnesium and aluminum, metallic chromium and tap water respectively, as well as analysis results of various materials are stated (Table 3). There are 4 figures, 3 tables, and 5 Soviet references.

ASSOCIATION: Kuybyshevskiy Industrial'nyy institut (Kuybyshev Industrial  
Card 2/2 Institute)



S/032/60/026/008/016/046/XX  
B020/B052

AUTHOR: Lazarev, A. I.

TITLE: Determination of Molybdenum and Tungsten by an Acidimetric Method

PERIODICAL: Zavodskaya laboratoriya, 1960 Vol. 26, No. 8, pp. 935-938

TEXT: The author recommends the determination of the end point in the acidimetric titration of molybdic and tungstic acids by applying a potentiometric method instead of using an indicator. The indicator electrode used was a cast antimony disc and the reference electrode was an AgCl electrode which also served as mixer. Besides the potentiometric method used for the determination of tungsten, the author also recommended the titration against methyl red. Molybdic acid is dissolved in an excess lye which is re-titrated against phenolphthalein. This method, however, is not sufficiently accurate. In the present paper the possibility is investigated as to whether molybdenum can be acidimetrically determined with a potentiometric control of its pH. For this purpose an ionometer of type VM-2M (IM-2M) was used. The potentiometric titration was carried

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Determination of Molybdenum and Tungsten by  
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B020/B052

out with 20 ml containing 0.45 mmole of sodium molybdate. 0.2 N HCl,  $\text{HNO}_3$ ,  $\text{H}_2\text{SO}_4$ , and oxalic acid solution were used for the titration in the presence of complex-forming mannite, glycerin, and oxalate compounds. The potentiometric titration curves of sodium molybdate with HCl,  $\text{H}_2\text{SO}_4$ , and  $\text{HNO}_3$  have almost the same shape (Fig. 1, Curve 1). In an aqueous alcoholic solution, the transition is more distinct, and the titration takes a somewhat different course (Fig. 1, Curve 2). The titration with oxalic acid is illustrated by Curve 3 of Fig. 1. The interaction between the molybdate and oxalic acid is accompanied by the formation of molybdenum-oxalic acid for which the following formulas have been published:  $[\text{MoO}_3(\text{C}_2\text{O}_4)]^{2-}$ ,  $[\text{MoO}_2(\text{C}_2\text{O}_4)]$ , and  $[\text{MoO}_2(\text{C}_2\text{O}_4)_2]^{2-}$  (Refs. 1-3). The increased acid consumption is due to the development of  $[\text{MoO}_2(\text{C}_2\text{O}_4)]$ . Transition curve 4 is obtained (Fig. 1) for the titration of the molybdate by a mixture of equal volume portions of hydrochloric and oxalic acids. A weak, complex acid (Ref. 4) is formed from mannite and molybdate. A clear jump of the pH

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is observed during the titration of a molybdate - mannite mixture (Fig. 1, Curve 5). Toward the end of the titration, the solutions turn blue due to the reducing effect of metallic antimony. Thus, the potentiometric titration of molybdates can only be carried out within certain pH ranges. An addition of complex-forming compounds (mannite or glycerin) does not noticeably improve the titration. The analysis of molybdenum is described. Table 1 gives the results obtained by the acidimetric method and that of the bismuth-amalgam reduction. In some cases the results are statistically evaluated by the method described by N. A. Alyavdin (Ref. 7). The author studied the possibility of a direct potentiometric titration of tungstates by various acids. From the results obtained, the potentiometric titration curves were plotted (Fig. 2). The titration of tungstic acid by indicators is practically impossible. The pH variation in the HCl and  $\text{HNO}_3$  (0.2 N) titration is represented by curve 2 (Fig. 2), Curve 4 (Fig. 2) shows that with oxalic acid, tungstate-oxalic heteropolyacid is formed. The course of titration observed with a tungstate-glycerin mixture and HCl differs from the rest of the titration curves. The maximum jump is observed in the presence of mannite. A potentiometric and an indicator method were worked

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Determination of Molybdenum and Tungsten by  
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B020/B052

out for the determination of tungsten in various compounds, the analyses  
are described, and the results obtained for tungsten by the conventional  
gravimetric method and the one suggested here, are compared.  
There are 2 figures, 2 tables, and 13 references: 10 Soviet, 2 British,  
and 1 French.

ASSOCIATION: Akmolinskiy sel'skokhozyaystvennyy institut (Akmolinsk  
Agricultural Institute)

✓  
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Card 4/4

S/032/60/026/008/023/046/XX  
B020/B052

AUTHORS: Popov, I. F., Rodzayevskiy, V. V., and Lazarev, A. I.

TITLE: News in Brief

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 8, p. 949

TEXT: A method is suggested for the separation of molybdenum and tungsten from rhenium, which is based upon the adsorption of these elements on  $MnO_2$ . During the separation of molybdenum, 50 - 100 ml of the alkaline solution containing rhenium and molybdenum, are neutralized with sulfuric acid (1:2) until the bromophenol blue turns yellow. For each 60 mg of molybdenum in the sample, 8 ml of 0.25 N potassium permanganate solution, 7 ml of a 0.5 M Mohr's salt solution, and 3 ml of 0.25 N sulfuric acid are added. During four minutes the solution is boiled, cooled down, and poured into a 200 ml measuring flask, which is filled up to the mark with distilled water. After filtering, rhenium is colorimetrically determined in an aliquot part of the solution by ammonium rhodanide and tin chloride. The colored complex is extracted by butyl alcohol. Prior to the

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News in Brief

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B020/B052

analysis of substances with low manganese content, 5 ml of a 0.5 N manganese sulfate solution are added to the portion of the solution to be analyzed. Furthermore, 5 ml of 0.5 N  $\text{MnSO}_4$ , 7 ml of a 1 N sodium acetate solution, and 10 ml of a 0.25 N potassium<sup>4</sup>permanganate solution are also added. The solution is boiled for four minutes, cooled down, and then treated in the above manner. The same method is employed for the separation of tungsten.  $\text{MnO}_2$  absorbs tungsten more easily than molybdenum. ✓

ASSOCIATION: Balkhashskiy gorno-metallurgicheskiy kombinat (Balkhash Mining and Metallurgical Kombinat)

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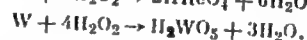
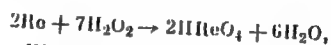
SOV/80-33-2-36/52

AUTHOR: Lazarev, A. I.

TITLE: Brief Communications. Recovery of Rhenium from Tungsten-Rhenium Alloys

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 2, pp 468-469 (USSR)

ABSTRACT: 20 g of tungsten-rhenium alloy and 100 ml perhydrol, placed in a 500 ml flask, were heated on a water bath. The acidity of the solution, and consequently the rate of solution, increased in time:



Fresh amounts of perhydrol must be added to replace the spent perhydrol. The rate of solution can be increased by using a mixture of 20 ml nitric acid and 50 ml perhydrol. The solution of the alloy contains rhenic acid, pertungstic acid, and hydrogen peroxide. On boiling, hydrogen peroxide is decomposed and pertungstic acid is precipitated as tungstic acid. Rhenic

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Brief Communications. Recovery of Rhenium  
from Tungsten-Rhenium Alloys

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acid remains in the solution and can be separated as potassium or ammonium rhenate. In a variant of the above method, the boiling solution of the alloy was neutralized with  $\text{Ca}(\text{OH})_2$  using congo red indicator; subsequently excess  $\text{Ca}(\text{OH})_2$  was added (30% of the amount used for the neutralization), the solution was boiled for 15 min and left for 2 hr in a water bath. After cooling, filtering through a glass filter, and 3 washings with saturated lime solution, the filtrate was passed through a column filled with 100 g KU-2 or SBS cation exchange resin.  $\text{Ca}^{2+}$  was absorbed, and  $\text{ReO}_4^-$  remained in the solution. The rhenic acid solution was then neutralized with KOH or  $\text{NH}_3$ , evaporated, and desiccated under an infra-red lamp. The yield of rhenium in both variants exceeded 99%. There are 6 Soviet references.

ASSOCIATION:

Akmolinsk Agricultural Institute (Akmolinskiy sel'skokhozyaystvennyy institut)

SUBMITTED:

August 31, 1959

Card 2/2



30655  
S/136/61/000/011/004/007  
E193/E383

5.2200

AUTHORS: Rodzayevskiy, V.V. and Lazarev, A.I.

TITLE: Preparation of high-purity tellurium

PERIODICAL: Tsvetnyye metally, no. 11, 1961, 52 - 54

TEXT: In an attempt to develop a rational method of preparation of tellurium with no more than 0.01 - 0.05% impurities, several refining processes were studied. Technical-purity Te and  $\text{TeO}_2$  were used as the starting materials, their chemical analyses being given in Table 1. Acid and alkaline leaching in the presence of an oxidizing agent, smelting with NaOH and sulphating roasting were tried for refining crude tellurium. Of these, the latter method gave the best results, the bulk of Se being distilled-off in the second stage of the process at 500 - 550 °C. On leaching the sulphate with NaOH (used in a quantity 10% in excess of that theoretically required to convert all the tellurium to sodium tellurite), 98% of the initial Te content is recovered, other impurities (Cu, Fe, Cr and Al) being separated at the same time. After neutralizing the filtrate with  $\text{H}_2\text{SO}_4$  tellurium dioxide was

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Preparation of high-purity .....

<sup>30655</sup>  
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E193/E383

obtained containing 73.6% Te, 0.08 - 0.09% Se, 0.155% Fe and 0.14% S. Regarding the treatment of technical  $\text{TeO}_2$ , a NaOH leach at 60 - 70 °C can be used to separate Si, Fe, Cr and magnesium, to reduce considerably the Cu and Al contents and to dissolve practically all the Te. Subsequent treatment with  $\text{H}_2\text{SO}_4$  yields a product containing 69% Te, 0.04% Se, 3.27% Si, 0.10% Fe and 0.37% S. Since the stoichiometric content of Te in  $\text{TeO}_2$  is 79.95% Te, the products obtained by either of the above methods can be regarded as fairly pure. Metallic tellurium can be obtained by dissolving  $\text{TeO}_2$  in  $\text{HCl}$ , followed by precipitation of Te with  $\text{SO}_2$ , by electrolysis in a NaOH solution and by reducing smelting, the two former methods being used in Soviet industry and the latter in Canada. Since the products obtained by the present authors from crude  $\text{TeO}_2$  contained a large quantity of Si, the possibility of eliminating this impurity by reducing smelting was investigated. To this

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S/136/61/000/011/005/007  
E193/E135

AUTHORS: Rodzayevskiy, V.V., and Lazarev, A.I.

TITLE: New sources of rhenium

PERIODICAL: Tsvetnyye metally, no.11, 1961, 55-58

TEXT: In a search for new sources of rhenium, its behaviour in ore-dressing processes and its content in mine waters and in Cu/Mo and polymetallic ores were studied. During beneficiation of Mo ores, Re followed Mo and no detectable quantities of Re were found in the tailings. The isomorphic mode of association between Re and Mo was indicated by the fact that it had proved impossible selectively to leach out Re during oxydation of Mo concentrates. On leaching a MoS<sub>2</sub> concentrate with a 30% sodium hypochlorite solution, the rate of dissolution of Re in the initial stages was faster than that of Mo, but the Re/Mo atomic concentration ratio ( $1.2 \times 10^{-3}$ ) in the final solution was practically identical with that in the concentrate. When MoS<sub>2</sub> becomes oxydized under natural conditions, Re is converted to water-soluble form, since, after becoming oxydized to the higher oxide Re<sub>2</sub>O<sub>7</sub>, it forms a strongly mono-basic acid HReO<sub>4</sub> which can react with oxides or

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E193/E135

# New sources of rhenium

carbonates of alkali metals to form rhenates, all of which are more or less soluble in water. This explains the absence of Re in oxydized Mo, Mo/Cu, and polymetallic ores. Examination of polymetallic, sulphide ore deposits in Kazakhstan had revealed that there is no connection whatever between the occurrence of Re and that of other metals (Cu, Pb, Zn, etc). Out of 200 samples analysed, 21 contained both Re and Mo, 17 containing Mo only. The Re and Mo concentration varied between 1 and 2 and 10 and 30 g/ton, respectively: occasionally, a sample contained 3 times more Re than Mo. Examination of chalcopyrite, sphalerite, galenite and other minerals showed that they contained occluded particles of Re-bearing minerals. In a majority of samples of these minerals no Re was detected; others contained 0.002-0.004% Re, with isolated cases of the Re content being 0.01 or even 0.3%. The chemical nature of these occlusions has not yet been established. The specific character of the Re compounds in Cu/Mo and polymetallic ores was also indicated by the results of ore-dressing tests. During beneficiation of a polymetallic ore, containing 1.8% Cu, 0.2% Pb, 0.0008% Mo and 0.0003% Re, the following

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New sources of rhenium

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recoveries were attained: 96% Cu, 70% Pb, 30% Mo, and 60% Re; 35% Re was found in the tailings. In the case of an ore from another Cu/Mo deposit, 85% Re was found in the tailings, 10% in the Cu concentrate, and 3% in the Mo concentrate. Whereas recovery of Re from the Mo concentrate was impossible and from the Cu concentrate difficult, it was relatively easy to extract it from the tailings: 30% could be dissolved in agitated and aerated water at room temperature; on adding 5% sodium carbonate the quantity of dissolved Re increased to 50%; after heating to 90 °C in a 5% sodium carbonate solution, 90% Re was recovered. The behaviour of Re and Mo during the beneficiation of yet another three types of ore is illustrated by data given in Table 3. Examination of 8 samples of mine waters from different mines of polymetallic ore deposits showed that only two of them contained Re in the concentration of 0.042-0.95 mg/litre, the Re content in mine waters of Cu/Mo ore deposits being 0.035-0.055 mg/litre. A method based on the application of an organic, complex-forming compound (unspecified) was developed, which can be used for extracting Re from any solution, irrespective of its concentration and/or Mo content.

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LAZAREV, A.I.; RODZAYEVSKIY, V.V.

Photometric determination of rhenium by use of diethyldithiophosphoric acid. Zhur.anal.khim. 16 no.2:243-244 Mr-Apr '61. (MIRA 14:5)

1. Akmolinsk Agricultural Institute.  
(Rhenium--Analysis)

23596

55300

1160, 1273, 2203

S/075/61/016/003/007/007  
B106/B208

AUTHORS: Ryabchikov, D. I. and Lazarev, A. I.

TITLE: Rhenium determination in alloys

PERIODICAL: Zhurnal analiticheskoy khimii, v. 16, no. 3, 1961, 366-367

TEXT: In the photometric determination of small rhenium amounts in alloys by the thiocyanate method (Ref. 1: Sendel Ye. B., Kolorimetricheskoye opredeleniye sledov metallov, Goskhimizdat, M., 1949) copper interferes by forming a sparingly soluble thiocyanate. In a previous paper (Ref. 2: Ryabchikov D. I., Lazarev A. I., Zh. analit. khimii 4, 228 (1955)) the authors had devised a method for the photometric determination of rhenium in solutions containing up to  $2 \cdot 10^{-3}$  g-ions of copper per liter. In this method copper was bound by thiourea to a colorless complex. In the presence of high thiourea concentrations a complex of rhenium with thiourea is formed which shows other optical properties than the thiocyanate complex. In the present paper, the authors describe the rhenium determination in alloys which contain iron as the principal mass, and besides large amounts

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S/075/61/016/003/007/007  
B106/B208

Rhenium determination in alloys

of aluminum, manganese, nickel, and up to 15% copper. Determination was made by the thiocyanate method after separating the remaining components of the alloys. 0.1 g of the alloy is dissolved in a mixture of 5 ml hydrochloric acid (1:2) and 5 ml nitric acid (1:1) with slight heating. The solution is concentrated to a volume of 0.5-1 ml on a water bath. Concentrating must be carefully performed, as rhenium compounds are volatile from acid solutions. 5 ml of concentrated HCl is added to the residue, it is concentrated again, and this procedure is repeated once more. The residue is dissolved in 50 ml of distilled water and the solution is passed through a cation exchanger column at a rate of 4 ml/min. The rhenium passes over into the filtrate as an anion. A 50-ml burette was used as exchanger column, it was filled with 10 g of the KY-2 (KU-2) cationite, and had a glass-wool stopper at the lower end. The exchange resin was converted to the H-form prior to use by washing through the column with 100 ml of 2 N sulfuric acid, and then with 100 ml of distilled water. For complete elution of the rhenium anions, the column is washed with 150 ml of distilled water. The filtrate combined with the washings which now contains the total rhenium content of the specimen is diluted with distilled water to 250 ml in a graduated flask. The cations adsorbed on the exchanger are eluted with

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Rhenium determination in alloys

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200 ml of 4 N sulfuric acid; the cations can be determined in the acid solution. The described separation of rhenium from the other components of the alloy lasts up to 50 minutes. 5-10 ml of the rhenium solution in the graduated flask are filled into a 50-ml flask, and mixed with 20 ml of hydrochloric acid (1:1), 2 ml of a 50% potassium thiocyanate solution, and 2 ml of a 20% solution of  $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$  in concentrated hydrochloric acid.

After adding each of the above reagents, the solution is thoroughly mixed. The flask is made up to the mark with distilled water. After 10 minutes, the optical density of the solution is measured in an  $\Phi\text{K-M}$  (FEK-M) photoelectric colorimeter through a blue filter against distilled water as reference solution. The rhenium content is determined by a calibration curve plotted by means of standard solutions of pure potassium perrhenate in 1 N hydrochloric acid. To accelerate and to simplify the described rhenium determination, the direct photometric determination of rhenium with thiourea was used (Ref. 2). In acid solutions, thiourea forms, with rhenium compounds in the presence of reducing agents, a greenish complex compound whose absorption maximum lies in the shortwave band of the visible spectrum. The optical density of the solutions of the complex is directly

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S/075/61/016/003/007/007  
B106/B208

# Rhenium determination in alloys

proportional to the rhenium concentration in a wide concentration range (5-160  $\mu\text{g}$  of Re in 25 ml). The molar absorption coefficient of the complex is  $6.2 \cdot 10^3$ . At room temperature, the complex is only slowly formed. The opening up of the specimen and the evaporation of nitric acid takes place in the way mentioned above. The concentrated solution is then dissolved in 50 ml of distilled water, as above, and made up to 200 ml in a measuring flask. 25 ml of this solution are mixed with 10 ml of concentrated HCl in a 50-ml flask, and cooled. After addition of 10 ml of a 5% aqueous solution of thicurea and 2 ml of a 20% solution of  $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$  the flask is filled up with distilled water. The optical density of the solution is measured through a color filter with maximum transmissivity at 400 m $\mu$ . The table shows results of rhenium determinations in alloys by the two methods described. There are 1 table and 4 Soviet-bloc references.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo AN SSSR, Moskva (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy AS, USSR, Moscow)

SUBMITTED: March 14, 1960

Card 4/5

RODZAYEVSKIY, V.V.; LAZAREV, A.I.

New sources for the preparation of rhenium. TSvet. met. 34  
no.11:55-58 N '61. (MIRA 14:11)  
(Rhenium) (Tailings (Metallurgy))

LAZAREVA, V.I.; LAZAREV, A.I.; RODZAYEVSKIY, V.V.

Determination of molybdenum by its catalytic action. Zhur.anal.-  
khim. 17 no.1:65-69 '62. (MIRA 15:2)

1. Tselinograd Agricultural Institute.  
(Molybdenum--Analysis) (Catalysis)

LAZAREV, A.I.; LAZAREVA, V.I.; ZAK, S.Sh.; USTENKO, T.M.

Determination of rhenium with  $\alpha$ -furyldioxime after the separation of molybdenum by the extraction with a chloroform solution of nitron. Zav.lab. 28 no.11:1316-1319 '62. (MIRA 15:11)

1. TSelinogradskiy sel'skokhozyaystvennyy institut i Dzhezkazganskiy gornometallurgicheskiy kombinat.  
(Rhenium--Analysis) (Oximes)

LAZAREV, A.I.; LAZAREV, V.I.; KOLAYEVSKIY, V.V.

Catalytic properties of phenol. Zhur. anal. khim. 12 no. 1:  
202-207 F 163. (1971) 17:1.

1. Tselinograd Agricultural Institute.

LAZAREV, A.I.

Conjecture about the nature of the luminous particles observed  
by astronauts. Dokl. AN SSSR 156 no. 2:306-307 My 64.  
(MIRA 17:7)

1. Predstavleno akademikom V.P. Linnikom.

RYABCHIKOV, D.I.; LAZAREVA, V.J.; LAZAREV, A.I.

Determination of rhenium by the kinetic method. Zhur. anal.  
khim. 20 no.9:960-965 '65. (MIRA 18:9)

1. Institut geokhimii i analiticheskoy khimii imeni V.I.  
Vernadskogo AN SSSR, Moskva.



L 16671-65 EWT(m)/EWP(b) RAEM(c)/SSD/AFWL/ASD(m)-3 JD/JG  
ACCESSION NR: AP4045848 S/0075/64/019/009/1110/1116

AUTHOR: Ryabchikov, D. I.; Lazarev, A. I.; Lazareva, V. I. B

TITLE: Photometric determination of microimpurities in rhenum and its preparations 27

SOURCE: Zhurnal analiticheskoy khimii, v. 19, no. 9, 1964, 1110-1116

TOPIC TAGS: spectrophotometry, colorimetric analysis, vanadium, nickel, tin, cobalt, manganese, iron, chromium, zinc, rhenum

ABSTRACT: Since small amounts of impurities affect the properties of rhenum it was necessary to develop a method for the determination of these impurities. The photometric method was used for the determination of vanadium, nickel, tin, cobalt, manganese, iron, chromium and zinc. The optical density of solutions was measured with a SF-5 spectrophotometer and a FEK-M photoelectric colorimeter. The Beer-Lambert law was obeyed for the solutions of all elements except vanadium. The amount of element was determined from the calibration curve or by the method of standard additions. Vanadium was determined from its

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L 16671-65  
ACCESSION NR: AP4045848

catalytic effect on the oxidation of aniline with chlorate in a weakly acid medium. At room temperature the rate of reaction is insignificant and the desired sensitivity is obtained by keeping the solution on a steam bath for 10 minutes. Nickel was determined by the extraction-photometric method using  $\alpha, \alpha'$ -furyldioxime. Copper interferes with this determination. Tin was determined using 9-phenyl-2,3,7-trihydroxy-6-fluorone as the reagent in the presence of citric acid. The molar extinction coefficient of this complex at 505 m $\mu$  is  $7.7 \times 10^4$ . Manganese was determined as permanganate, produced by oxidation of divalent manganese with potassium periodate. Iron was determined using  $\alpha, \alpha'$ -dipyridyl complex with divalent iron. The iron was reduced using hydroxylamine, while thiourea was used for masking copper, silver and mercury. Diphenylcarbazide was used as the reagent for hexavalent chromium. Complexon III was used to increase the stability of ethanolic solutions of diphenylcarbazide. Cobalt was determined using nitro-P salt. Zinc was separated from interfering elements by extraction and determined using methylene blue. Orig. art. has: 1 figure and 8 tables.

Card 2/3

L 16671-65  
ACCESSION NR: AP4045848

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo  
AN SSSR (Institute of Geochemistry and Analytical Chemistry AN SSSR)

SUBMITTED: 26Sep63

ENCL: 00

SUB CODE: GC, IC

NO REF SOV: 023

OTHER:001

Card 3/3

L 15999-66 EWT(m)/ENP(t) IJP(c) JD

ACC NR: AP5024143

SOURCE CODE: UR/0075/65/020/009/0960/0965

AUTHOR: Ryabchikov, D. I.; Lazareva, V. I.; Lazarev, A. I.

33  
B

ORG: Institute of Geochemistry and Analytical Chemistry im. V. I. Vernadskiy,  
AN SSSR, Moscow (Institut geokhimii i analiticheskoy khimii)

TITLE: Determination of rhenium by kinetic method

SOURCE: Zhurnal analiticheskoy khimii, v. 20, no. 9, 1965, 960-965

TOPIC TAGS: rhenium, catalysis, selenium compound, spectrophotometry

ABSTRACT: Small and trace amounts of rhenium were usually determined from their catalytic effect on the reaction between tellurate and bivalent tin in an acid medium. An experiment was made on substituting selenate for tellurate. The reaction  $\text{SeO}_4^{2-} + 3\text{Sn(II)} + 8\text{H}_3\text{O}^+ \rightarrow \text{Se} + 3\text{Sn(IV)} + 12\text{H}_2\text{O}$  is normally very slow, but it increased noticeably in the presence of rhenium. The rate of catalytic reaction

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UDC: 543.70

L 15999-66

ACC NR: AP5024143

was proportional to the changes with time of the optical density of observation of the reaction for determining the rhenium content. A suspension of elemental Se was obtained in the presence of gum arabic. The optical density of the suspension was measured by the SF-5 spectrophotometer. The transparent selenium hydrosol, in the presence of gum arabic, had a redish color. The maximal light absorption was found in the ultraviolet part of the spectrum. A study of the catalytic effect of rhenium on the oxidation-reduction reaction between the selenate and bivalent tin, as a function of the type and concentration of acids, selenates, bivalent tin, and foreign admixtures, produced a method for the analysis of phenium-containing substances. For the determination of rhenium in solution, 2 ml of 0.5M potassium selenate solution, 2 ml of 2M tartaric acid solution, 0.2 ml of 2% gum arabic solution, 3 ml of 0.45M of bivalent tin chloride in hydrochloric acid (1:3), and distilled water to the mark. After 30-90 minutes measure the optical density in a cuvette (tray) with a 10 mm layer at 380-400 m in reference to the water. The duration of the color development depends on the content of rhenium. The reference experiment is necessary. The content of rhenium is determined by the method of additions. Orig. art. has: 14 formulas, 8 figures, and 1 table.

SUB CODE: 07, 11

SUBM DATE: 25 May 64/

ORIG REF: 008/

OTH REF: 003

Card 2/2

1 14008-85 EXT(c)/EMP(t)/EMP(b) LJP(c) JD/JG  
ACCESSION NR: AP5007670

S/0032/65/031/003/0270/0272

AUTHORS: Lazarev, A. I.; Tronina, Ye. M.

TITLE: Determining small quantities of vanadium by the catalytic effect of the compounds

SOURCE: Zavodskaya laboratoriya, v. 31, no. 3, 1965, 270-272

TOPIC TAGS: photometry, vanadium compound, aniline, bromine, oxidation reduction reaction

ABSTRACT: The authors investigated the catalytic effect of vanadates on the oxidation-reduction reaction between aniline and bromate. They considered the rate of reaction to depend linearly on change in optical density with time, and the reaction was then studied photometrically. The effects of bromate, aniline sulfate, and vanadate concentration and of acidity, foreign compounds, and time were investigated in seeking the optimal conditions for the reaction. The experiments were carried out at room temperature. The analytical procedure is outlined in the paper. It was found that the reaction rate is directly proportional to bromate and vanadate concentrations. The rate increases linearly very

Card 1/3

L 34003-55

ACCESSION NR: AP5007670

rapidly with aniline sulfata concentrations at low values, but much more slowly at concentrations above 0.01 mole/liter, and at 0.04 mole/liter begins to decline. The color intensity is proportional to the period of reaction. The reaction rate slows down with increase in pH. Oxalic, tartaric, and citric acids and Trilon B decrease the reaction rate. Pyrophosphate has no appreciable effect. The tangent and fixed time methods give similar results. It was found that the rate of oxidation-reduction reaction between bromate and aniline may be expressed by the kinetic equation

$$V = \kappa \cdot C_{\text{VO}_3}^m \cdot C_{\text{A}}^n \cdot C_{\text{H}^+}^p$$

where  $\kappa$  is the catalytic coefficient and C is the concentration of reacting substance. The symbols m and n are unity for an aniline coefficient up to 0.02 M and a vanadate coefficient up to  $5 \cdot 10^{-7}$  M. At higher concentrations the values decline. The linear dependence of reaction rate on pH is due to increase in redox potential of the bromate-bromide system and to vanadium content in solution. That the reaction takes place in an acid environment is indication that the cation is the active form of vanadium. When vanadium is bound in complexes by some reagent, the reaction rate declines. Orig. art. has: 2 figures and 1 table.

Card 2/3

L 34009-66

ACCESSION NR: AP5007670

ASSOCIATION: Tselinogradskiy sel'skokhozyaystvennyy institut (Tselinograd  
Agricultural Institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: 00, 0P

NO REF SOV: 006

OTHER: 000

Card 3/3



LAZAREV, A.I.; LAZAREVA, V.I.; REGUZOVA, Z.V.

Method of differential spectrophotometry based on the measurement of photoelectric current by means of photoelectrocolorimeters. Zav. lab. 31 no.9:1064-1066 '65. (MIRA 18:10)

1. Novomoskovskiy filial Gosudarstvennogo nauchno-issledovatel'skogo i proyektного instituta azotnoy promyshlennosti i produktov organicheskogo sinteza.

12926-66

ACC NR: AP6000180

EWI(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b) JD

SOURCE CODE: UR/0032/65/031/012/1437/1438

AUTHOR: Lazareva, V. I.; Lazarev, A. I.

ORG: Novomoskovskiy Affiliate, State Scientific Research and Design Institute of the Nitrogen Industry and Organic Synthesis (Novomoskovskiy filial Gosudarstvennogo nauchno-issledovatel'skogo i proyektного instituta azotnoy promyshlennosti i produktov organicheskogo sinteza)

TITLE: Extraction of photometric determination of bismuth in cast iron

SOURCE: Zavodskaya laboratoriya, v. 31, no. 12, 1965, 1437-1438

TOPIC TAGS: photometric analysis, microchemical analysis, bismuth, cast iron

ABSTRACT: The feasibility of the iodide method of determining trace quantities of bismuth in cast iron is investigated. Ascorbic acid, thiocarbamide, potassium iodide, and citric acid were added to a solution of cast iron. The bismuth complex was extracted by ethyl- or amylacetate. Bismuth was separated from the extract by means of a citric acid solution of pH = 9. The final bismuth content was determined after re-extraction by the iodide method; the sensitivity of the method was as high as  $5 \cdot 10^{-4}\%$  from 1 g suspensions. Tabular data were given as follows:

Card 1/3

UDC: 546.87 : 543.432

L 12926-66

ACC NR: AP6000180

Determination of bismuth content in cast iron

Added Bi, micrograms	Found Bi		% Error
	micrograms	$10^{-3}\%$	
--	23; 24; 25	2.4	--
18	43; 45; 47	4.5	+7
--	18	1.8	--
18	40	4.0	+11
--	7	0.7	--
18	27	2.7	+8

Antimony (III) in quantities up to 0.3 mg/ml did not hinder the determination. The details of the method are given. Optical density was measured on an FEK-N-57 with a blue filter ( $\lambda_{\text{eff}} = 453$  millimicrons) in a 50 mm cuvette, and compared to water. The bismuth analysis was based on the formula

$$\% \text{Bi} = \frac{D_4 - D_0}{D_{x+a} - D_x} \cdot a \cdot 2500,$$

where  $a$  is quantity of added bismuth;  $D_0$ ,  $D_x$  and  $D_{x+a}$  are optical densities of dummy

Card 2/3

L 12926-66

ACC NR: AP6000180

solution, the analyzed solution, and the analyzed solution with bismuth additions, respectively. Methods of increasing the sensitivity are discussed, especially with regard to the use of differential aberration in the optical density apparatus. Orig. art. has: 1 table.

SUB CODE: 07,14/

SUBM DATE: 00/

ORIG REF: 002/

OTH REF: 000

Card 3/3

LAZAREV, A.I.; PINEGIN, N.I.

Threshold light intensity of moving point sources. Dokl. AN  
SSSR 161 no.4:958 Ap '65. (MIRA 18:5)

1. Submitted July 24, 1964.

ACC NR: AF6019018

(N)

SOURCE CODE: UR/0032/66/032/001/0024/0025

AUTHOR: Lazarev, A. I.; Lazareva, V. I.; Uksho, N. S.

ORG: Institute of New Chemical problems, AN SSSR (Institut novykh khimicheskikh problem Akademii nauk SSSR)

TITLE: Determination of titanium in titanium nitride by photometric titration in a photometric colorimeter

SOURCE: Zavodskaya laboratoriya, v. 32, no. 1, 1966, 24-25

TOPIC TAGS: titanium, titanium compound, photometric analysis, colorimetric analysis, NITRIDE

ABSTRACT: Photocolorimetric analysis is carried out in a FEK-type photoelectrocolorimeter by using two methods. The first method requires special devices: a cell-paralelepipedal wooden cell holder, and a mixer. The second method is less convenient but does not require any special arrangement. Titrant is added into a flask containing a titrated solution, the cell is filled with a colored solution, the absorbance is measured with respect to water, the solution is again poured from the cell into the flask, etc. Solutions having an initial absorbance of  $<1$  (better  $\sim 0.5$ ) should be used with a noticeably high absorption of light and without photocurrent intensification. For making the analysis, an 0.3 g sample of Ti nitride is placed into a 100 ml flask, 20 ml of  $H_2SO_4$  solution (1:1) and 2 g of Na nitrate are added, and the mixture is heated. If

Card 4/2

ACC NR: AP6019018

the sample is not dissolved, then the solution is cooled, 0.5 g of nitrate is added and the mixture is heated up to the beginning of liberation of  $H_2SO_4$  vapors without permitting precipitation. The cooled solution is transferred into a 100 ml measuring flask, 0.5 N  $H_2SO_4$  solution is gradually added, 1 ml of perhydrol is poured in, and the content is brought to the mark with the same acid. An aliquot part of the solution is then placed in a titrating glass and neutralized with 10% solution of NaOH until a weak, yellowish-green color appears. Then 7-10 ml of 1 N  $H_2SO_4$  and 25 ml of 0.05 M complexon III are added. After 10 minutes, 3-5 drops of 0.5% xylenol orange are added and the excess of complexon is titrated with a 0.05 M solution of Bi nitrate prepared from metallic Bi and 0.5 N  $HNO_3$ . A green filter is used. The equivalent point is found graphically. The Ti content is calculated from the following formula:

$$\%Ti = \frac{(V_1 k_1 - V_2 k_2) 47.9 \cdot 0.05 \cdot 100 \cdot 100}{g V_s \times 1000}$$

where  $V_1$  is the volume of the complexon added,  $V_2$  is the amount of Bi nitrate consumed,  $k_1$  and  $k_2$  are correction coefficients,  $V_s$  is the volume of aliquot, and  $g$  is the weight of the sample. Orig. art. has: 1 fig. and 1 formula.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 002

L 10523-65 EEO-2/ENG(1)/FSF(1)/ESS-2/ENG(1)/EWI(1)/FS(1)-3/EEC(k)-2/  
 EWG(a)/EEC(t)/EWG(c)/EWG(v)/EWA(d)/EEC-4 Po-4/Pa-5/Pq-4/Pac-4/Pac-2/P1-4  
 ACCESSION NR: AP4036722 ASD(a)-5/AEDG(b) B/0020/64/156/002/0306/0307  
 TT/GW

AUTHOR: Lazarev, A. I.

TITLE: Assumptions on the nature of luminous particles observed by astronauts

SOURCE: AN SSSR. Doklady\*, v. 156, no. 2, 1964, 306-307

TOPIC TAGS: upper atmospheric layer, luminous particle, micrometeorite, incandescent particle, particle collision, illumination threshold

ABSTRACT: The assumption that luminous particles observed by astronauts through illuminators of space ships on entering the Earth's shadow are micrometeorites incandescent on collision with the ship's surface or particles torn from the ship's surface by the impact, is substantiated by calculations. The relationships between the temperature of the particles of different diameter and the time elapsed after collision, and between illumination and time after impact, and values for the illumination threshold at different angular velocities were plotted (Figs. 1, 2). Assuming the particles are spherical, their

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L 10523-65  
ACCESSION NR: AP4036722

volume heat capacity = 1 cal/cc, the radiating capacity of their surface = 0.8, initial temperature after impact = 2500°K, and angular velocity  $\omega$  in the astronaut's field of vision =  $10^4$ - $10^6$  deg/sec (when the distance between the astronaut and the particle = 1 m). The calculations show that particles 1 micron in diameter are not observable; 10-micron particles moving at  $\omega = 10^4$  deg/sec can be seen for 2-3 milliseconds; 10-micron particles moving faster than  $\omega = 10^5$  deg/sec will not be seen; 50-micron particles moving at  $\omega =$  less than  $10^5$  deg/sec will be visible for tens of milliseconds; at  $\omega = 10^6$  deg/sec, 50-micron particles will be visible for 4-5 milliseconds. The author indicates photometric measurements of particle illumination and its duration can be used for investigating micrometeorites in the upper atmospheric layers. "In conclusion I express appreciation to H. I. Pinegin for interest in the work and consideration of the results obtained." Orig. art. has: 2 figures and 5 equations.

ASSOCIATION: none

SUBMITTED: 10Oct63

ENCL: 01

SUB CODE: ES,SV

NO REF SOV: 002

OTHER: 000

Card 2/3

L 10523-65  
ACCESSION NR: AP4036722

ENCLOSURE: 01

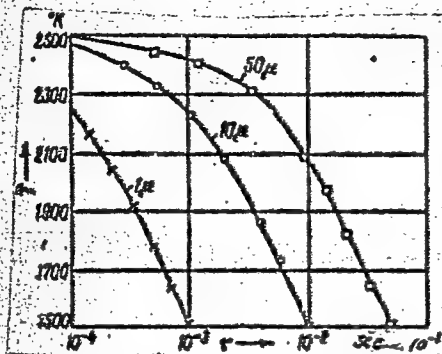


Fig. 1  
Temperature of particles after  
collision

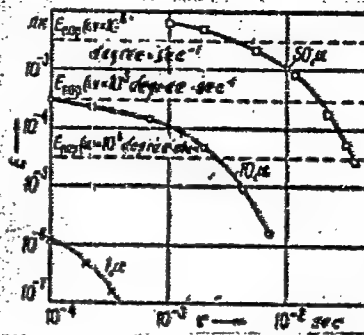


Fig. 2  
Illumination  
generated by particles on  
the astronaut's pupils.

Card 3/3

CHUDNOVSKIY, A.F.; BABANOV, A.A.; KAGANOV, M.A.; LAZAREV, A.I.; CHERNYAKOVA,  
M.A.

Equipment for testing the heat capacity and heat conductivity of  
metals at high temperatures and data for certain heat-resistant alloys.  
Trudy LPI no. 224:203-216 '63. (MIRA 17:9)

ACC NR: AP6030017

SOURCE CODE: UR/0020/66/169/005/1068/1070

AUTHOR: Lazarev, A. I.; Timokhin, V. I.

ORG: none

TITLE: Thermal radiation of the earth that is scattered by aerosol layers

SOURCE: AN SSSR. Doklady, v. 169, no. 5, 1966, 1068-1070

TOPIC TAGS: thermal radiation, earth radiation, atmospheric scatter, thermal radiation detector

ABSTRACT: Experimental investigations of variations in atmospheric radiation in the spectral region 3.5-5.2  $\mu$  were carried out on the nights of 13 and 25 May 1964 in the Moscow region from an airplane at altitudes of 8 to 9 km by means of an infrared radiometer. The air temperature at this altitude was approximately  $-45^{\circ}\text{C}$  while the ground surface temperature was  $9-11^{\circ}\text{C}$ . The recorded difference of effective radiances of the night sky were approximately one order of magnitude greater than was to be expected from the thermal radiation of the atmosphere at a temperature of  $-45^{\circ}\text{C}$ , and this discrepancy is attributed to the thermal radiance of the earth which has been scattered by the aerosol layers of the tropopause and of the lower stratosphere. An expression is derived and used to compute the effective radiance as a function of the zenith angle. Presented by Academician A. A. Lebedev on 30 November 1965. Orig. art. has: 4 figures, 5 formulas.

SUB CODE: 08,04/  
Card 1/1

SUBM DATE: 19Nov65/

ORIG REF: 007

UDC: 551.521

LAZAREV, A. I.

"New Method of Study of Heat Transfer of a Plate in Conditions of Natural Convection", Sb. Rabot Stud. Nauch Obshch., Leningrad. Inst. Tochnoy Mekhaniki i Optiki. No 8, 1953, pp 3-11.

A new method of determining the coefficient of the heat transfer of a plate is devised on basis of the regular norm method. The results of measurements of the coefficient of heat transfer for various inclination angles of the plate with respect to the horizon are presented in condition of free convection in the air. (RZhFiz, No 1, 1955)  
SO: Sum. No. 443, 5 Apr. 55

LAZAREV, A. I.

Lazarev, A. I.

"New Methods and Instruments for Investigating the Heat of Transformation and Specific Heat of Metals at High Temperatures." Min Higher Education USSR. Leningrad Inst of Precision Mechanics and Optics. Leningrad, 1955 (Dissertation for the degree of Candidate in Technical Science)

SO: Knizhnaya letopis' No. 27, 2 July 1955

*6-122-1114, 1111111111111111, I*  
LAZAREV, Aleksandr Ivanovich, kand.tekhn.nauk; UDAL'TSOV, A.N., red.;  
TOLCHINSKIY, Ye.M., inzh., red..

[Equipment for studying the heat of transformations and actual  
heat capacity of metals at high temperatures] Ustanovka dlia  
issledovaniia teplot prevrashchenii i istinnoi teploemkosti  
metallov pri vysokikh temperaturakh. Moskva, Filial Vses.in-ta  
nauchnoi i tekhnicheskoi inform., 1956. 27 p. (Pribory i stendy.  
Tema 4, no.P-501) (MIRA 10:12)  
(Metals at high temperatures) (Heat of transition)

A. LAZAREV, A.I.

USSR/Fitting Out of Laboratories - Instruments.  
Their Theory, Construction, and Use.

H-

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 8705

Author : Lazarev, A.I. and Dyn'kov, B.N.

Inst :

Title : Vacuum Apparatus for the Investigation of the True Heat Capacity of Metals at High Temperatures.

Orig Pub : Sb.: Issledovaniya v obl. teplovykh izmereniy [-Symposium on Research in the Field of Temperature Measurements], Moscow and Leningrad, Mashgiz, 1956, 5-20.

Abstract : A detailed description is given of equipment for the measurement of the true heat capacity of metals at temperatures up to 1000-1100°. The measurements are based on the investigation of the heat balance of two similar samples enclosed in a medium (copper block) of uniformly increasing temperature. A experimental technique is described and a method given for interpreting the results obtained.

Card 1/2



USSR/Fitting Out of Laboratories - Instruments.  
Their Theory, Construction, and Use.

H-

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 8705

Results from the determination of the true heat capacity of eutectoid steel are given. On the  $C_p$ -T curve recorded with the apparatus described, a number of anomalies are observed, corresponding to the Curie point of cementite, the magnetite  $\alpha \rightarrow \beta$  transition, and to the eutectoid transition, marked by a discontinuity in the curve.

Card 2/2

LAZAREV, A.I.

Category : USSR/Atomic and Molecular Physics - Hert

D 4

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6286

Author : Lazarev, A.I.

Title : New Methods for Determining the Heat of Melting and Transformation of Metals.

Orig Pub : Issledovaniya v obl. teplovykh izmereniy. M.-L., Mashgiz, 1956, 21-31

Abstract : Methods are described, by which it is possible to determine the heat of melting and transformations in metals and using a setup developed by the author for the investigation of the true specific heats of metals. (Referet Zhur Fizike, 1956, 25291). The transformation heat is measured by placing two identical hollow specimens, one of which contains the heater, in the chamber of a metallic block calorimeter, the temperature of which varies linearly with time. To measure the melting temperature one of the specimens, made of metal having a known specific heat, is made solid. The second specimen is made hollow and the metal having the unknown

Card : 1/2

*- LAZAREV, A.I.*  
Category : USSR/Atomic and Molecular Physics - Statistical physics. Thermodynamics D-3

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 856

Author : Lazarev. A.I.

Title : Results of Measurement of Transformation Heats and of the True Specific Heat of Steels over a Wide Temperature Range

Orig Pub : Issledovaniya v. obl. teplovykh izmereniy. M.-L., Mashgiz, 1956, 73-88

Abstract : No abstract

Card : 1/1

SOV/137-57-11-22589

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 11, p 280 (USSR)

AUTHOR: Lazarev, A. I.

TITLE: Absolute Method for Measuring the Heat of Solidification and the True Heat Capacity of Metals in the Solid and Liquid States  
(Absolyutnyy metod izmereniya teploty zatverdevaniya i istinnoy teployemkosti metallov v tverdom i zhidkom sostoyanii)

PERIODICAL: V sb. : Issledovaniya v obl. teplovykh izmereniy i priborov.  
Leningrad, 1957, pp 19-29

ABSTRACT: Description of an absolute method for the investigation of the true heat capacity (H) of metals in the liquid state and the heat of solidification, based on the comparison of the true H of the metal investigated with the energy supplied to the electric heater. The method also permits carrying out sufficiently precise measurements of the true H of metals in the solid state and in the presence of sharp variations in the magnitude of H. The vacuum apparatus for the investigation consists of a sealed massive metal block calorimeter (BC) inside of which two specimens are mounted. One specimen ( $S_1$ ) consists of a metallic shell filled with the liquid metal investigated; the shell

Card 1/3

SOV/137-57-11-22589

Absolute Method for Measuring the Heat of Solidification (cont.)

of the other specimen ( $S_2$ ) contains an electric heater consisting of a Nichrome spiral coil, the ends of which are welded to Nichrome tips which prevent the escape of heat through the feed cables. The shells of both specimens are identical and are manufactured from a metal which does not dissolve in the liquid metal investigated. The investigation begins with a rapid heating of the BC with the specimens to a temperature  $20 - 30^\circ\text{C}$  in excess of the maximum temperature of the measurements. Then the BC is gradually cooled to a temperature  $10 - 15^\circ$  below the maximum temperature, and as a result of this a difference  $\theta_I$  arises between the temperatures of BC and  $S_1$ . Then an electric current is supplied to the heater within  $S_2$  which would be necessary to produce a difference  $\theta_{II}$  [Russian original shows  $\theta_I$  here,  $\theta_{II}$  subsequently; Transl. Note] between the temperatures of BC and  $S_2$ ,  $\theta_{II}$  being close to  $\theta_I$ . A formula is adduced for the calculation of the true specific  $H$  of the liquid metal investigated for similar values for  $\theta_I$  and  $\theta_{II}$ . In the process of measurement of the heat of solidification the current supplied to the heater of  $S_2$  (in this case  $\theta_{II}$  differs from  $\theta_I$  and the formula for the calculation assumes a different appearance) either is kept constant or is regulated in such a way as to keep  $\theta_{II}$  close to  $\theta_I$ . The rate of cooling of BC in this case is kept constant during the whole period of solidification. Experimental data are adduced from Card 2/3

SOV/137-57-11-22589

Absolute Method for Measuring the Heat of Solidification (cont. )

the investigation of the true  $H$  and of the heat of solidification of Zn and Cu. It is pointed out that the error in the measurement of the true  $H$  by the above-mentioned method amounts to 3 - 4% and the error in the measurement of the heat of solidification is 5%. The results obtained are close to the tabulated data for the heat of fusion of Zn and Cu.

L. G.

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KISELEV, K.A., LAZAREV, A.I.

Temperature field of an endless plate at variable values of the  
heat transfer coefficient and variable temperature of the exte-  
rior medium. Zhur. tekhn. fiz. 30 no.6:616-621 Je '60.

(MIRA 13:8)

(Heat--Transmission)  
(Thermodynamics)

S/0033/64/041/002/0366/0370

ACCESSION NR: AP4032730

AUTHOR: Lazarev, A. I.

TITLE: Infrared radiation of matter in circumsolar space

SOURCE: Astronomicheskii zhurnal, v. 41, no. 2, 1964, 366-370

TOPIC TAGS: astronomy, interplanetary space, infrared radiation, radiometer, circumsolar space

ABSTRACT: An investigation of infrared radiation of matter in circumsolar space can be made using the atmospheric windows of transparency in the range of wavelengths 2-5  $\mu\text{m}$  and 8-12  $\mu\text{m}$ . The most favorable conditions for observation are at high-mountain stations where the atmosphere is nearly dust-free and humidity is low. In the spectral regions 3.5-5.0  $\mu\text{m}$  and 8-12  $\mu\text{m}$ , where atmospheric radiation is determined primarily by thermal radiation, the most favorable observation conditions are at low temperature and low atmospheric humidity. Preliminary investigations of the infrared radiation of matter in circumsolar space from the earth's surface were made in the spectral regions 1.8-3.0  $\mu\text{m}$  and 3.5-5.2  $\mu\text{m}$ . Measurements in the spectral region 1.8-3.0  $\mu\text{m}$  were made with an infrared radiometer with an uncooled PbS photoresistor and a germanium filter.

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ACCESSION NR: AP4032730

cutting off short-wave radiation to  $1.8 \mu\text{m}$ . The radiometer had a field of view of  $1^\circ$ . Measurements were made on clear sunny days at about 1200 hours at an air temperature of  $10-15^\circ$  and a relative humidity of 65-80%. In the spectral region  $3.5-5.2 \mu\text{m}$  the measurements were made with a radiometer with a PbTe photoresistor cooled to  $-190^\circ$  and an interference filter cutting off short-wave radiation to  $3.5 \mu\text{m}$ . The radiometer field of view was  $1^\circ 20'$ ; measurements were made on clear sunny days between 1100-1200 hours at a temperature of  $-10$  to  $-15^\circ$  and a relative humidity of 60-80%. When measurements were made from the earth the radiometers recorded the total brightness of atmospheric radiation and matter in circumsolar space with atmospheric transmission taken into account. Results of measurements in different planes show that in the case of identical elongations the brightness of the radiation in the plane of the ecliptic recorded by the radiometer is considerably greater than in the plane perpendicular to the plane of the ecliptic. The difference is particularly well expressed in the spectral region  $3.5-5.2 \mu\text{m}$  where the brightness of scattered solar radiation (rapidly increasing with a decrease of elongation) is considerably less than in the region  $1.8-3.0 \mu\text{m}$ . This indicates that at least in the plane of the ecliptic the radiometer recorded not only atmospheric radiation, but also the radiation of matter in circumsolar space. The results also confirm the assumption of greater density of matter in

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ACCESSION NR: AP4032730

the plane of the ecliptic than in the plane perpendicular to it. The emissivity of circumsolar space is computed. Orig. art. has: 9 figures and 6 formulas.

ASSOCIATION: none

SUBMITTED: 12Sep63

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SUB CODE: AA

NO REF SOV: 003

OTHER: 004

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ACCESSION NR: AT4037535

S/2563/63/000/224/0203/0216

AUTHOR: Chudnovskiy, A.F.; Babanov, A.A.; Kaganov, M.A.; Lazarev, A.I.; Chernyakova, M.A.

TITLE: Equipment for measuring the heat capacity and thermal conductivity of metals at high temperatures, and data for some heat resistant alloys

SOURCE: Leningrad. Politekhniicheskiy institut. Trudy\*, no. 224, 1963. Lit-eyny\*ye svoystva zharoprochny\*kh splavov (Castability of heat-resistant alloys), 203-216

TOPIC TAGS: castability, heat resistant alloy, iron based alloy, nickel based alloy, Nichrome alloy, austenitic steel, cast steel, high alloy steel, alloy composition, cast alloy steel, alloy No.3, alloy Kh1, alloy Kh32, alloy No. 6, steel 10KhSND, steel 15KhSND, steel 65 G, steel 1Kh18N9, transformer steel, alloy heat capacity, alloy thermal conductivity, hollow sphere measuring procedure, alpha calorimeter measuring procedure, heat capacity measurement, heat conductivity measurement

ABSTRACT: Special equipment (see Fig. 1 in the Enclosure) was designed and constructed to measure the heat capacity and thermal conductivity of metals at

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temperatures up to 1000C and to obtain curves for the dependence of these parameters on temperature. The hollow sphere procedure was used to measure thermal conductivity, while heat capacity was determined by means of a technique involving two samples, one of which acts as a calorimeter and the other as a so-called "alpha calorimeter". Metals tested included a number of heat resistant alloys (see Nekhendzi, Yu. A., p. 9-23, this same book, for compositions) and other cast alloy steels. The results indicate that the specific heats coincide closely at similar temperatures for alloys of widely varying composition. Sharp peaks in the gamma to alpha conversion range were noted for 10KhSND, 15KhSND and 65 G. Similar peaks, but at varying temperatures, were noted for ferritic steels with 5% Si, steel 1Kh18N9 and heat resistant alloys not subject to such conversions. Thermal conductivity values ranged from about 55-65 cal/m·degrees at 100C to about 25-35 at 800C, except for 65 G (about 42 at 200C to about 25 at 800C) and alloy No. 3 (about 10 at 150C to about 5 at 850C). Orig. art. has: 12 graphs and 6 formulas.

ASSOCIATION: Leningradskiy politekhnicheskii institut im. M.I. Kalinina  
(Leningrad Polytechnical Institute)

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